

one is conveying nuclei into or making nuclei out of different media." How it comes about that a perfectly definite degree of supersaturation is required to cause condensation on such nuclei, whether an electric field is applied or not, and whether they have been produced by strong or weak radiation or by other means, he does not attempt to explain. He brings forward in support of his view the further consideration that, "if a marked difference in efficiency of positive and negative ions is granted, then any ionised emanation neutral as a whole, like that of phosphorus, should produce two groups of nuclei. On condensation there should be two groups of coronal particles interpenetrating and subsiding through each other in the way I have frequently instanced in other experiments. No such effect has been observed." The answer to this is simply that the nuclei causing the phosphorus clouds are not free ions, like those produced by X-rays.

Prof. Barus concludes with a suggestion as to the origin of atmospheric electricity, according to which nuclei become negatively charged as the solution which they contain becomes diluted by absorption of water.

C. T. R. WILSON.

THE GEOLOGY OF AUSTRIA-HUNGARY.

TO know, even in a general fashion, the provinces of Austria-Hungary, with their immense range of scenic types and their picturesque variety of nationalities, goes far in itself towards a liberal education. The lover of landscape, as well as the geologist, will find much of interest in the new "Führer für die geologischen Exkursionen in Oesterreich," issued in connection with the ninth International Geological Congress in Vienna. This bulky work is divided, like that of the Russian congress, into numerous separate brochures, but forms, none the less, a permanent work of reference for our libraries. To obtain the guide and other publications before they become scarce, a subscription to the secretariat of the congress of twenty-seven shillings or so every three years seems not a heavy price to pay.

In the Austrian guide we have the work of some forty-five authors, describing in a compact and lucid form the districts that they have made their own. In this respect, though covering a far wider field, it resembles that handbook of English geology, the "Geological Excursions," issued by our Geologists' Association. The names of the writers imply in themselves the spirit of a scientific congress. We do not see the groups and cliques seated in the parliamentary Chamber in Vienna, and threatening one another with the literal outpouring of ink; but we find instead a body devoted in common to the reception of the stranger, and anxious that in each province he shall find something memorable and distinctive.

Dr. Jahn opens with the Older Palæozoic area of Bohemia, which includes the Moldau sections above Prag and the ravine at Karlstein, one of the noblest scenes of mediæval Europe. Prof. A. Hofmann describes the silver-mines of Příbram, and Prof. Slavík and others deal with the Cretaceous of northern Bohemia. In this latter paper it is pleasant to note the insertion of the euphonious Tchech names of villages after the German forms, a practice already to some extent imitated in Ireland. August Rosiwal conducts us through the more severely German district of Karlsbad and other health-resorts upon the frontier. Prof. Suess's important theory of the distinction between nascent and "vadose" waters appearing at the earth's surface is duly referred to. If this series of papers leads to a better appreciation of the rural districts of Bohemia, the writers will have done good service. Few visitors have seen what lies upon the

plateau and outside the towns--the hamlets with bulbous church-towers, set of necessity beside the lakes, which gather in the hollows of the granite; the broad undulations of a purely agricultural landscape, broken here and there by some magnificent group of castle-towers; the crumpled rim of the country on the south-west, where one plunges down through the forest to Bavaria; or the sheer phonolite necks of the north, rising like islands above a haze formed by the smoke of Cainozoic coal. Here, however, we reach the holiday-region of the Elbe, known to dwellers in Dresden, and pleasantly described and illustrated by J. E. Hibsich in a brochure of seventy pages.

Another important series of papers deals with Galicia, the Miocene salt-beds of Wieliczka being, of course, included. Less visited are the petroleum-beds of Boryslaw, now one of the active fields of enterprise, where the folding of the Miocene strata assigns a maximum age to the uplift of the Karpathians. Oberberggrat Johann Holobek connects the various deposits of hydrocarbons with the extreme fissuring of the sandstones along the region of overfolding. Nearer the great chain, Oligocene menilite-shales are brought up over the Miocene on the south-west limb of the synclinal, and the oil, though flowing in fissures, appears generally accumulated in the bend.

What novelty lies before those who visit Drohobycz, Zaleszczyki, Kasperowce, and Worochta, following Drs. Grzybowski and Szajnocha, can only be known to those who have had glimpses of remote Galicia. Not the least interesting feature of Austrian Poland is the view of the drift-covered Russian plateau across the frontier, and the ever-present sensation of that mysterious and arbitrary *cordon*, along which the white-capped cavalry ride night and day and keep the verge of Europe.

From a geological point of view, the country of the famous limestone *Klippen* is of the first importance. Similar tectonic problems arise wherever beds of varying powers of resistance become crushed together. In a neat section V. Uhlig shows the relation of the northern "Klippenzone" to the overfolds and thrusts on the flank of the Tatra range. The fertile basin of Liptó is included on the south of the granite mass, and one can picture again the streams leaping into it from the forest-slopes of the Karpathians, and the grey crags towering up beyond, and the descent northward on the rain-swept levels of the Magura. This last region of little disturbed Eocene and Oligocene strata leads on to the highly faulted and upturned "Klippenzone." North of this the Older Cainozoic is strongly folded, whence Herr Uhlig concludes that the massive *Klippen* protected the corresponding beds on their south flank from the pre-Miocene earth-pressures. These same pressures had, however, considerable effect among the *Klippen* themselves, and have so far squeezed the masses of various ages together as to tend to obliterate unconformities. The author, however, urges that the band of *Klippen* represents a series of true islands of Jurassic strata in an Upper Cretaceous and Eocene sea, the deposits of which at one time practically overwhelmed them. They are thus not detached fault-blocks without roots, although the pre-Miocene movements have influenced their present prominence and position. Fig. 14 shows the bold character of the resulting scenery. The memoir then describes the structure of the Tatra chain, with a series of sections which will be welcomed by all who aspire to look further than the classic example of the Alps.

Perhaps one regretfully swings back to Salzburg and the Salzkammergut, though the detailed paper by E. Kittl on the stratigraphy of the latter area is accompanied by an admirable bibliography and a map

in colours. Yet why should one regret that a region of such preeminent scenery lies comparatively near us, and is at times unconformably overstepped by the non-geological tourist? The next series of papers carries us away to Styria and the valley of the Mur, where miles of torrent and ravine, of grey limestone crag above and sunny maize below, await the unconventional traveller, and lure him ever eastward, until he emerges on the plain of Hungary. Then follows a number of papers on the environs of Vienna, a city set so happily in a land of geological contrasts. Until we have seen and touched it, we scarcely realise that, a few miles south of Laxenburg, the dusty rise over a castle-crowned projection represents the passage of the Alps. South-west lies the true mountain-episode of the Semmering, fully expounded, with a fine map, by Franz Toula. Westward, we have the narrows of the Danube, and the variety of cliff and alluvial meadow so charmingly described by Prof. Penck. The river runs between Melk and Krems in a pre-Glacial valley, much of which was actually excavated before Oligocene times. The surface-features must originally have been very different, to allow of the formation of this deep cut across the southern projection of crystalline rocks, which almost connects Bohemia with the Alpine system.

The Dolomites, the Adige valley, and Predazzo still offer problems for many a friendly battle. The Carnic Alps present a newer field, and include the superb ravine of Pontebba, with a side-exursion to the limestone-fastness of the Predil. This comparatively low pass, with its fine angle on the south side, amid a veritable world of rocks, would in itself show how much awaits the tourist who will venture east of Venice.

Hungary will probably be dealt with in a special treatise for those who made the long excursion on the Danube. Bosnia and the Hercegovina are very briefly touched on, since the local government has prepared a separate "souvenir" for visitors. What this attention means will be appreciated by those who have experienced the hospitality of the "occupied provinces." From a congress down to the humble bicyclist, all receive a welcome in this old Slavonic highland, all visitors alike are considered of interest to the State. When one sits by the stream-side in some level *polje*, a lake-basin of Miocene times, and hears the muezzin call from the little wooden mosque among the trees, or when one chips the gabbros in the grim ravine of the Narenta while sun-browned hill-men, like stage-bandits, stride gravely past upon the road, then one can realise, with a grateful heart, what Austria-Hungary means, not only to the geologist, but to Europe.

GRENVILLE A. J. COLE.

NOTES.

A COMMISSION has been appointed by the French Navy Board to inquire into the migrations of the sardine and the causes of the disappearance of this fish. The commission includes Prof. Vaillant, of the Paris Natural History Museum; M. Fabre Domergue, Inspector-General of Sea Fisheries; and M. Canu, director of the agricultural station at Boulogne-sur-Mer.

OWING to the appointment of Dr. Martin to the directorship of the Lister Institute, the chair of physiology is vacant at the University of Melbourne. Particulars as to duties, emoluments, &c., will be in the hands of the Agent-General for Victoria after October 8. The new professor will be required to commence his duties on March 1, 1904.

NO. 1771, VOL 68]

AN international exhibition of the manufacture and industrial applications of alcohol will be held in Vienna in April and May, 1904.

A PRESS despatch from Berlin states that the Imperial budget for 1904, now in preparation, allots 7500*l.* for combating typhus, which is specially virulent in Bavaria, Prussia and Alsace-Lorraine.

AN international congress on school hygiene is to be held at Nuremberg from April 4-9, 1904, under the presidency of Prof. Griesbach, of the University of Strassburg. The general secretary is Dr. Paul Schubert, to whom all communications relative to the congress should be addressed.

A REUTER telegram from Rio de Janeiro of October 1 states that the Brazilian Chamber has adopted the third reading of the Bill to establish an international steerable balloon competition to be held at Rio in 1904. The scheme has been submitted to the Senate.

MR. H. MAXWELL LEFROY, who has been appointed entomologist to the Government of India, is to be stationed at Surat, in the Bombay Presidency, pending the establishment of the permanent headquarters of the Imperial Agricultural Department now being organised under the orders of Lord Curzon.

THE necessary legal formalities in connection with the change of name of the Jenner Institute have now been completed, the Board of Trade having sanctioned the new name. The Institute will, therefore, now be known as the "Lister Institute of Preventive Medicine." The address, Chelsea Gardens, S.W., remains the same.

SIR THOMAS HANBURY has promised the Pharmaceutical Society of Great Britain securities of the annual value of 25*l.* for presentation with the Hanbury gold medal awarded biennially for research in the natural history of drugs. The medal, founded in memory of Daniel Hanbury, brother of Sir Thomas, was awarded this year to M. Eugène Collin, of Paris. As the result of Sir Thomas Hanbury's gift future recipients of the medal will also receive the sum of 50*l.*

A PROVISIONAL programme of the ordinary meetings of the Royal Geographical Society for the session 1903-4 has been published. Among the subjects to be dealt with in the meetings of this year we notice north polar exploration, 1898-1902, by Commander R. E. Peary, and the Patagonian Andes, by Colonel Sir T. H. Holdich. The arrangements made for meetings after Christmas include, among others, the Gulf Stream, by Mr. H. N. Dickson; the régime of the Nile, by Sir William E. Garstin, G.C.M.G.; the lakes of New Zealand, by Mr. Keith Lucas; and some adventures in Antarctic lands and seas, by Lieutenant E. H. Shackleton (Christmas lecture to young people).

A KITE-FLYING competition was held at the Alexandra Palace on Saturday last under the auspices of the Aeronautical Institute. The length of wire or string to be used was limited to one mile, and marks were awarded on the following points:—(a) The manner in which the kite leaves the ground; (b) the manner in which it ascends; (c) the steadiness of the kite; (d) the length of time required to let out the whole mile of wire or string; (e) the greatest average of the altitude as taken by a series of observations during the course of one hour; and (f) the rapidity and manner of descent. Only three competitors put their kites to the test, and the contest was easily won by Mr. S. F. Cody, whose kite quickly reached the limit distance and remained steady at that altitude in a strong wind. The kite used was one of a number which is being prepared for consignment to Portsmouth Dockyard.